REMARKS / ARGUMENTS

In the Specification, the U.S. Patent Application Serial Number 09/979,588 has been corrected to: 08/979,588.

In the Original Claims, the previously submitted new claims 121-167 have been renumbered as new claims 122-168, and the originally filed claims 1-121 have been canceled.

The claims were objected to because some of the claims depended upon themselves. All such claims have been corrected to depend from a prior claim.

Accordingly, all objections have been addressed and corrected. Consequently, the objections to the claims are deemed to be overcome.

Claims 133, 137-142, and 165 have been rejected under 35 USC 112, first paragraph, as failing to comply with the written description requirement. The Examiner specifically objected to the use of the phrases "universal code", "common code", and to the word "care" with "don't care". To remove even the appearance of failing to comply with the written description requirement, claim 133 has been amended so as to no longer contain the phrase "universal code",

claims 137-142 have been amended so as to no longer contain the phrase "common code", and claim 165 has been amended so as to remove the word "care", replacing it with the words "attract, evaluate only, expect blank". The claims are now more clearly supported by the specification.

For example, claim 133 is supported at page 28, lines 11-12. Claims 137-142 are supported by page 28, and particularly by lines 16-17 of page 28. Claim 165 is supported by page 28, lines 13-15, and Fig. 4. The rejection under 35 USC 112, first paragraph is deemed to be overcome.

Claims 122 and 157 were rejected under 35 USC 112, second paragraph. These claims included the phrase "the expected shape" without antecedent basis. To overcome the rejection, claims 122 and 157 were made more clear by making more explicit that the "model pattern representing a training image of an object" has "an expected shape". Thus, the rejection of claims 122 and 157 under 35 USC 112, second paragraph, is deemed to be overcome. Further, since claims 123-156, and claims 158-168 depend from claims 122 and 157, respectively, the rejection of these claims under 35 USC 112, second paragraph, is also overcome.

Claims 122-123, 125, and 149-150 were rejected under 35 USC 102(b) as being anticipated by Gee, et al. (5,459,636) ("Gee"). Regarding claim 122, Gee does not teach a model pattern that includes "a plurality of field elements

disposed within a region of the training image that includes the boundary points", as required by claim 122. For example, see Figs. 11 and 12 to see a model pattern that includes BOTH "a geometric description including a plurality of pattern boundary points" AND "a plurality of field elements disposed within a region of the training image that includes the boundary points". By contrast, Gee teaches a model pattern that has ONLY boundary points, as shown in Fig. 4, where the "sampled contour model object 12" is shown with the target object 11, the sampled contour model object 12 being created by sampling every sixth contour point around the complete contour of the model object 12. It is the sampled contour model object 12 that is used by the system 20 of Gee. See col. 4, lines 39-43. Thus, the sampled contour model object 12 of Gee does NOT include "a plurality of field elements disposed within a region of the training image that includes the boundary points", as required by claim 122. There is NOTHING in Fig. 4, or any other figure of Gee, that teaches anything more than the model pattern of Gee consisting solely of those sampled contour points.

The Examiner appears to be suggesting that the plurality of "field elements" are the same as "size, shape, distance, etc", and also sites col. 3, lines 37-53. Yet, these lines merely discuss the "pose volume" 16 in "pose space" 15, as shown in Fig. 2 of Gee. Pose volume is defined in Gee as "the region of six dimensional space of possible positions and orientations for the model object 12". Col. 3, lines 49-51. Clearly, pose space 15 and pose volume are both NOT part of the sampled contour model object 12, but are instead created by moving

the sampled contour model object 12. Thus, Gee clearly lacks one of the essential elements of claim 122. Consequently, the rejection of claim 122 is deemed to be overcome.

Regarding claim 123, each field element of claim 122 comprises "a vector indicating distance and DIRECTION TO a nearest boundary point along a pattern boundary". By contrast, Gee teaches "minimum distance vector calculations for each data point in the model object 12 RELATIVE TO each point in the edge data 23". Col. 4, lines 14-19. Again, **the minimum distance vectors of Gee are NOT part of the model object 12**. Further, each minimum distance vector starts on a contour point P_m of the sampled contour model object 12, and ends on the target object 11. Thus, the vectors of Gee point AWAY from the boundary (contour) points, while the vectors of Applicant's claim 123 point TOWARDS the boundary points, as required by claim 123. Thus, Gee does not teach vectors as taught and claimed by Applicant. Further, Gee does not teach field elements that are part of a model pattern, as required by claim 122, from which claim 123 depends. Consequently, the rejection of claim 123 is deemed to be overcome.

Regarding claim 125, again, Gee does not teach field elements that are part of a model pattern. Thus, it's also clear that Gee does not teach field elements that include "a gradient direction at the nearest boundary point", as required by claim 125. The Examiner cites Figs. 8a-8d, but these figures merely show data representative of positions and orientations of a target at four different

times of the system, as explained in col. 6, lines 20-23. Further, since claim 125 depends from claim 122, deemed to be allowable, claim 125 is also deemed to be allowable.

Regarding claim 149, each field element of Applicant's invention includes information that is stored as a function of position. The Examiner cites col. 3, lines 49-65, which deal with "pose volume". However, pose volume is NOT part of the model object 12, or the sampled contour model object 12. Further, since claim 149 depends from independent claim 122, deemed to be allowable, claim 149 is also deemed to be allowable.

Regarding claim 150, the Examiner again cites col. 3, lines 49-66, which relates to pose volume, which is NOT part of the model object 12. Thus, the rejection of claim 150 is deemed to be overcome.

Claims 148 and 151 are rejected under 35 USC 103(a) as being unpatentable over Gee, in view of Bell et al. (5,550,937) ("Bell"). The Examiner asserts that Gee "arranges the field elements in two dimensions as shown in Fig. 1", yet Fig. 1 of Gee is SILENT on showing any field elements as taught and claimed by Applicants, showing instead only digitized images that serve as target and model objects. See col. 2, lines 65-67. Moreover, Bell also fails to teach field elements as taught and claimed by Applicant. Instead, Bell teaches "grid

matching points" that are used for image registration. See col. 6, lines 61-67, and col. 7, lines 1-35. The grid matching points of Bell are NOT part of a model, instead being added to two images from different image sensors with differing sensor geometry in an effort to correlate the two images for purposes of image registration. Col. 7, lines 3-6, and col. 7, lines 20-35. Thus, Bell does NOT teach a model with field elements, nor does Gee, so combining Bell with Gee would not result in Applicants' invention. Therefore, the rejection of claim 148 is deemed to be overcome.

Regarding claim 151, since claim 148 encompasses the limitations of this claim, an argument similar to that presented above for claim 148 is equally applicable to claim 151. Thus, the rejection of claim 151 is deemed to be overcome.

Claims 157 and 164 have been rejected under 35 USC 103(a) as being unpatentable over Gee. Claim 157 has been amended to more clearly claim the invention, such that now, in Applicants' invention, a "zone" is "characterized by an evaluation code for determining whether an image boundary point within the zone is to be evaluated". Thus, even if "vector components" are associated with each separated boundary points of the model 12 of Gee, every one of these vector components associated with every associated boundary point of the model 12 is fed into the neural nets of Fig. 6. Thus, in Gee, there is no determination as to whether an image boundary point within a zone will be

evaluated, since ALL boundary points are evaluated. Thus, a "vector component" is NOT functionally equivalent to an "evaluation code" of Applicants' invention. Gee does not teach evaluation codes, and therefore does not teach a "zone" that is "characterized by an evaluation code for determining whether an image boundary point within the zone is to be evaluated", as required by amended claim 157.

Further, the Examiner states that "the objective is to estimate, calculate or evaluate the image edge point", yet the neural net of Gee takes in vector components associated with image boundary points, and outputs adjustments in X, Y, angle, and scale so as so enable an adjustment module 27 to adjust the **position** of the model data 24 relative to the edge data 23, as stated in col. 4, lines 23-26. Thus, the rejection of claim 157 is deemed to be overcome.

Regarding claim 164, col. 4, lines 57-67 are cited, which refers to Fig. 5. Fig. 5 shows a minimum distance vector calculation. As established above, minimum distance vectors are NOT the functional equivalent to field elements. Further, since Gee does not teach "evaluation codes", Gee cannot teach "at least one field element that includes an evaluation code". Therefore, the rejection of claim 164 is deemed to be overcome.

The prior art made of record and not relied upon does not appear to present an impediment to the allowance of the present application.

Accordingly, Applicants assert that the present application is in condition for allowance, and such action is respectfully requested. The Examiner is invited to phone the undersigned attorney to further the prosecution of the present application.

Respectfully Submitted,

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